

CLAIMS

What is claimed is:

- 5 1. A voltage controlled oscillator (VCO) comprising:
at least one current amplifier for amplifying an input current; and
a variable resistor capacitor (RC) filter for varying the amount of signal delay in the
VCO.

- 10 2. A VCO as in claim 1, further comprising:
a filter for removing unwanted signal components from a biasing network.

- 15 3. A VCO as in claim 2, wherein the filter is capable of being bypassed using
at least one switch.

- 20 4. A VCO as in claim 1, wherein the variable RC filter includes at least one
variable capacitor for fine tuning the amount of signal delay in the VCO.

- 25 5. A VCO as in claim 1, wherein the variable RC filter includes at least one
variable capacitor for coarse tuning the amount of signal delay.

- 30 6. A VCO as in claim 1, wherein the RC filter includes a composite voltage
variable capacitor (VVC) for enabling the RC filter to be finely tuned.

7. A VCO as in claim 6, wherein the composite VVC utilizes a plurality of
bias reference voltage and at least one tuning control voltage for adjusting a precise
capacitance value.

8. A voltage controlled oscillator (VCO) including a current mode delay cell
comprising:

a first current amplifier for amplifying an input current;
a resistor capacitor (RC) tuning network for varying the amount of amplification
and delay of an output of the first current amplifier; and
a second current amplifier for amplifying an output current from the RC tuning
5 network.

9. A VCO as in claim 8, wherein the RC tuning network includes at least one
variable resistor for controlling the gain of the first current amplifier and second current
amplifier.

10

10. A VCO as in claim 8, wherein the RC tuning network includes at least one
variable capacitor for fine tuning the amount of signal delay in the delay cell.

15

11. A VCO as in claim 8, wherein the RC tuning network includes at least one
variable capacitor for coarse tuning the amount of signal delay in the delay cell.

12. A VCO as in claim 8, further comprising at least one filter for providing a
low noise bias voltage from at least one bias supply.

20

13. A VCO as in claim 12, wherein the at least one filter is capable of being
switchably bypassed from at least one bias supply.

14. A VCO as in claim 8, wherein the RC tuning network includes a composite
voltage variable capacitor (VVC) for enabling the RC filter to be finely tuned.

25

15. A VCO as in claim 14, wherein the composite VVC utilizes a plurality of
bias reference voltage and at least one tuning control voltage for adjusting the capacitance
value.

16. A method for providing signal delay in a voltage controlled oscillator (VCO) using a delay cell comprising the steps of:
amplifying an input current with at least one current amplifier; and
5 adjusting the amount of signal delay from the at least one current amplifier using a delay network.

17. A method for providing signal delay in a VCO as in claim 16, wherein the delay network includes at least one variable resistor and at least one variable capacitor for
10 providing adjustable signal delay.

18. A method for providing signal delay in a VCO as in claim 16, wherein the at least one current amplifier includes a first current amplifier at an input of the VCO delay cell and a second current amplifier at an output of the VCO delay cell.

15
19. A method for providing signal delay in a VCO as in claim 16, further comprising the step of:
providing a bias to the VCO delay cell using a switchable filter that is capable of being bypassed.

20
20. A method for providing signal delay in a VCO as in claim 16, further comprising the step of:
coarse tuning the amount of signal delay in the VCO delay cell using at least one variable resistor.

25
21. A method for providing signal delay in a VCO as in claim 16, further comprising the step of:
fine tuning the amount of signal delay using at least one variable capacitor.

22. A method for providing signal delay as in claim 16, wherein the step of adjusting includes:

5 tuning a resistor capacitor (RC) network using a composite voltage variable capacitor (VVC) for fine tuning the amount of signal delay.

23. A method for providing signal delay as in claim 22, wherein the composite VVC utilizes a plurality of bias reference voltages and at least one tuning control voltage for adjusting the capacitance value.